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Climate Change Is Here, but Who Is Paying for It?

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BACKGROUND

In an era of increased political polarization and decreased confidence in national institutions, many bold initiatives have stalled or met an untimely end. This abdication of federal responsibility is no more evident than the ongoing response to COVID-19. Strategic response to the pandemic has largely shifted from the White House to governors' mansions.

A renewed era of federalism is beginning to take shape, and it is important to consider potential ramifications in other pressing areas—specifically climate change. State and local governments have advanced their own initiatives on climate change when faced with a failure of federal leadership. States have launched climate strategies to combat this growing threat both individually and in coalition. However, in order to mitigate and develop resiliency to climate change, much more needs to be done. This analysis will look at one aspect of the challenge: understanding costs.

Resource management for states with ever-thin operational budgets is already logistically daunting without the massive investment in preventative measures needed to meaningfully combat climate change. Where do they start? Do states across the board have the technical capacity to understand what impacts they have already been facing? The resounding answer at this current moment is no.

States are receiving limited help from outside sources. Much of the current literature is confined to broad national and sector-wide analysis of economic impact or the increasing expense of disaster relief. Little attention has been given to the potential ramifications of those impacts through the lens of individual states. States are the unit of change and federal intervention should not be viewed as inevitable. Any preventative or mitigating initiatives will have to be constructed with a firm understanding of the scope of specific challenges facing various regions and localities.

As research remains focused on the proportional responsibility of climate change in impact assessment, states miss the opportunity to be proactive in adapting to and mitigating climate change as it affects them. Looking at current and future costs holistically can help states plan, manage, and act more efficiently to mitigate increased severity in the future. Broad preventative investment could lead to large reductions in reactionary spending. In order to build a case for policy and investment, states need to understand the cost of current and anticipated impacts. To be blunt: too much time and effort is spent approximating the responsibility of climate change vs. "normal" variability rather than understanding impact costs right now and preparing for them to increase in the future. Some states are beginning to approach the issue from this perspective, most notably Colorado with the launch of its new "Future Cost Avoidance Explorer" (FACE),[1] but this must become the norm rather than the extraordinary.

With that as our goal, this brief addresses four main questions:

- What unique challenges are states facing and what common impacts open the door for collaboration?
- What is the current state of impact research?
- What challenges are states facing in tracking climate expenditures?
- What are the next steps?

WHAT IS HAPPENING?

Currently, state climate expenditures and costs are being absorbed without a recognition of underlying causes. For example, disaster response is becoming more frequent and burdensome; healthcare costs are increasing as air pollution becomes more prevalent in growing economies and warming climates; and property values are decreasing as climate dangers are becoming more apparent. The consensus is clear: climate change is not only here, it is accelerating.

It is imperative to note that this paper is reviewing costs to states as government entities—infrastructure (e.g., road repairs), operating costs (e.g., personnel to address weather emergencies), and increased health care costs paid for by the state. What is glaringly left out of this analysis is the cost borne by the residents of the states. Similar to the state analysis, states should work to understand how much it costs their residents to cope with climate change, how people are absorbing those costs, how the costs differently impact different demographics, and how to promote environmental equity moving forward.

The first step is addressing what impacts states are facing. Arguably, no state is facing more visible and dangerous threats than Florida. Rising sea levels have increased beach erosion and tidal flooding, threatening long-term tourism prospects in coastal communities. Increasing ocean temperatures are instrumental in amplifying impacts from hurricanes. Due to seawater intrusion, freshwater resources in South Florida are being pushed dangerously close to depletion. In these problems, Florida is not alone. Gulf states and the entire eastern seaboard are at risk of increasingly powerful storms and coastal erosion. Virginia, Maryland, and Delaware

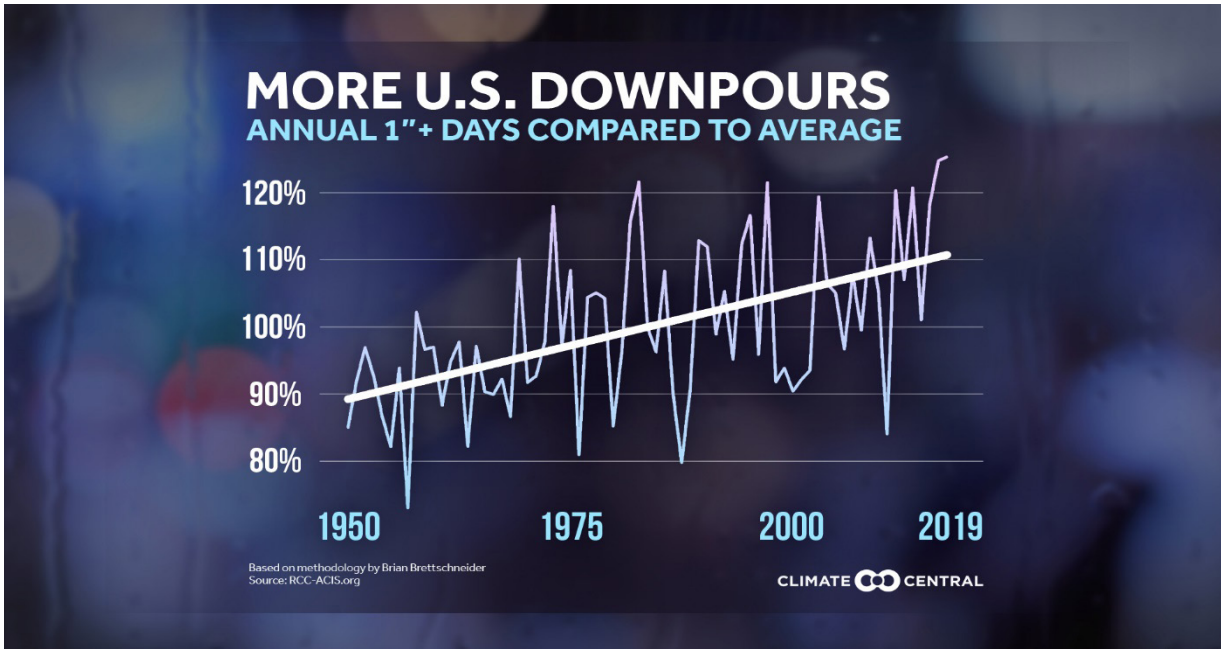
1. Colorado Department of Natural Resources. 2020. "Future Avoided Cost Explorer." May 14. https://cwcb.colorado.gov/FACE.

are suffering from similar issues of seawater intrusion.[2] And while these commonalities invite collaboration, individual states face unique challenges.

This need for both regional collaboration and the need for unique state-centric solutions can be seen across the country. Northeastern states like Vermont, New Hampshire, and New York are dealing with shortened winters and a decreased snowpack that could disrupt a multibillion-dollar regional winter tourism economy. Western states like Colorado, Utah, Nevada, Washington, and Wyoming are facing similar issues, but each face other unique challenges rooted in a common cause. Increasing temperatures in Vermont are expected to cause a retreat of maple trees into colder climates,[3] impacting the largest source of maple syrup in the country, a nontrivial part of the state economy. Increasing temperatures combined with growing economies in Colorado[4] and Utah[5] are manifesting in increased ground-level ozone pollution.

Sporadic precipitation patterns are resulting in increased drought in the west, exacerbating wildfire threats, and inflaming concern over water resource sharing and infrastructure. Yet, Missouri, Nebraska, Indiana, and Oklahoma have been forced into a cycle of recovery from "once in a century" flood events while Oklahoma suffers from dwindling groundwater resources.[6]

Figure 1. More U.S. Downpours



Severe precipitation events are increasing[7] and resulting in increased strain on local infrastructure. How are these costs being absorbed into state economies and how are state governments accounting for it? The current lack of state resiliency spending does not instill confidence that states are adequately prepared to deal with these impacts.

2. United States. 2018. United States Global Change Research Program. *Fourth National Climate Assessment*. November 23. https://nca2018.globalchange.gov/.
3. United States. 2018.
4. Finley, B. 2020. "What's Polluting Colorado's Air? 125 Million Tons a Year of Heat-Trapping and Hazardous Gases." *The Denver Post*. January 19. https://www.denverpost.com/2020/01/19/colorado-air-pollution/.
5. Herbert, G. Utah State of the State Address. Salt Lake City, UT, January 31, 2019.
6. United States. 2018.
7. Brettschneider, B. 2020. "National: 1 day rainfall totals compared to average (2020)" *Climate Central*. April 29. https://www.climatecentral.org/gallery/graphics/national-1-day-rainfall-totals-compared-to-average-2020.

Taking these regional issues a step further, states will also have to contend with impacts to shared resources. For example, as water temperatures rise, water quality management in the Great Lakes is becoming increasingly difficult.[8] What share of the response does Illinois bear versus Michigan or Wisconsin? This highlights the need for increased collaboration.

This mentions nothing of urban heat islands magnifying the effects of severe heatwaves on local healthcare infrastructure; or increased respiratory illness in sections of the country whose environments are becoming more conducive to air pollution known only to previous generations.[9] States need to begin planning for the complexities of their own agricultural sectors and anticipate less hospitable environments to traditional crops. These issues, many of which fall outside of strict requirements needed to meet the threshold of "federally declared disaster," are absorbed into a national profile of climate impacts but are glaring when focus is narrowed.

Innovation is key to mitigating these problems, and innovation is possible should resources be put in place. In a world where the buck stops at the governor's mansion, what mechanisms do states utilize? What funding sources should be tapped? How do states allocate funding for particularly vulnerable sections of society? Even if we know that the severity of impacts will only increase, the first step is dealing with the impacts that we are seeing right now and determining where resources need to be allocated. Herein lies the problem; we don't know who is already paying.

WHAT DOES CURRENT RESEARCH SAY?

Current research is geared much more toward sector-wide impacts. Thanks to consistent National Climate Assessments and various avenues of academic research, national, sector-wide, and regional impacts are generally well explored. Climate connection to stressors on energy systems, agricultural yields, and healthcare, to name a few, are being established and economic impacts are being anticipated. But while these broad social costs are important to understand when comparing large scale investment options, it does little for policy makers in the short-term.

However, concerning perspective, there is a persistent gap. Though it is valuable to identify potential impacts to the broader economy, these assessments have been approached under the guise of inevitable federal intervention. Prescribed solutions have been generalized over broad interstate areas without consideration for determining what impacts will be borne by individual state operating budgets in a world of a state-centric response. Existing federal-state grants could serve as the vehicle for getting increased funding to states.[10] However, even if the opportunity were to arise where large amounts of federal funding were made available to address many of these regional impacts, most states do not have the infrastructure or plans to spend the dollars in a way that would reduce the impacts short term or long term. This would have to primarily serve as funding for assessment and planning.

The limited research that approaches this question of state expense is unable to account for the brunt of current impacts, most likely to be borne by individuals and private businesses. Because we are in the infancy of state responses to climate change, it is not surprising that a strict analysis of current state budgets shows that most states are applying only between 0.5% and 1.5% of their operational expenditures on climate related initiatives.[11] The scope of that analysis was unable to account for persistent impacts to public health, declining property

8. United States. 2018.
9. Reilly, K. 2019. "More Than 141 Million Americans Are Breathing Unhealthy Air as Pollution Worsens." *Time.* April 24. https://time.com/5577203/state-of-the-air-pollution-report-2019/.
10. Profeta, T., and J. Symons. 2020. "Federal Grants to States: Opportunities for Climate Change Assessment, Planning, Programs, and Information Exchange." Nicholas Institute for Environmental Policy Solutions PB 20-05. Durham, NC: Duke University. https://nicholasinstitute.duke.edu/publications.
11. Gilmore, E.A., and T. St. Clair. 2018. "Budgeting for Climate Change: Obstacles and Opportunities at the US State Level." *Climate Policy* 18(6): 729–741.

values in communities threatened by sea level rise and increasingly frequent severe weather events, or impacts to seasonal economies and those that depend on them. States must begin to assess their own oversights, correct, and plan for future amplification of impacts.

WHAT CHALLENGES DO STATES FACE MOVING FORWARD?

Though it is limited, some research has addressed challenges that states encounter in identifying climate impacts. First and perhaps most daunting is the construction of the problem itself. Because of its diffuse and gradual nature, it is difficult to disentangle climate spending from overall spending. For example, as temperatures increase and more sporadic and severe precipitation events impact a region, to what extent should increased infrastructure repair costs be attributed to climate change? This same question can also be applied to decreased agricultural exports as severe summer temperatures increase in frequency, and increased health impacts from amplified heatwaves or worsening air pollution. From the perspective of the states, this should not be the focus. The underlying cause of any increase in expenditure will surely be multicausal and going forward we should be wary of losing the sight of the forest through the trees.

Addressing this issue will require a fundamental shift in interpretation away from attributing proportional cause and toward a more general acceptance on the issue—preventative climate investments could lead to broad reductions in reactionary spending. This is no more evident than in increased relief spending for billion-dollar weather and climate disasters. Though attributing this increase entirely to climate change would be scientifically irresponsible and it is understood that there are many underlying causes: hurricanes are becoming more destructive, severe weather events are intensifying, droughts are extending, and regional flooding is increasing in frequency. An analysis of disaster expenditure tracked by NOAA showcased this by concluding that there has been a substantial five percent annual increase in billion-dollar disasters since 1980.[12] By shifting focus from a proportional to holistic approach, states will be able to more effectively allocate funding for preventative measures that address underlying causes of rising costs.

Following this shift in perspective, it is also vital that states account for the total amount of money that is being spent in state, regardless of the money's origin. Because so much of disaster relief and preparedness spending is intertwined with federal resources, the overall cost of climate spending is often hidden from strictly state expenditures. As Pew wrote in its 2018 report: "Pew recommends that state and federal policy makers make collecting comprehensive data a priority. Better data would inform debates about how much each level of government could pay and highlight opportunities to manage growth in overall costs."[13] This is increasingly important as the federal government looks to cost sharing, and it should be understood how this affects state behavior. Strategic deployment of resources will surely be different when the primary goal is not to leverage for increased federal funds.

States are also facing a daunting task of revamping the process of recording expenditures. Because many states report spending at the department and subdepartment level rather than the funding allocated to specific programs,[14] it is difficult to determine what funding specifically goes to climate initiatives and what goes to other non-climate related programs. This especially holds true with various agencies devoted to public health or transportation infrastructure. States must also increase their capacity for tracking capital expenditures. Due to the inherent longevity of climate mitigation and resiliency investment, projects with expected usefulness for 10+ years that are primarily financed through capital investment will be key focal points. Currently, only 24 states release capital expenditure reports, and this will need to be reviewed moving forward.[15]

12. Smith, A.B., and R.W. Katz. 2013. "U.S. Billion-dollar Weather and Climate Disasters: Data Sources, Trends, Accuracy and Biases." *Natural Hazards* 67: 387–410.
13. Pew. 2018. "What We Don't Know About State Spending on Natural Disasters Could Cost Us." June 19. https://www.pewtrusts.org/en/research-and-analysis/reports/2018/06/19/what-we-dont-know-about-state-spending-on-natural-disasters-could-cost-us.
14. Gilmore, E.A., and T. St. Clair. 2018.
15. Gilmore, E.A., and T. St. Clair. 2018.

These issues also mention nothing of intentional obfuscation in states where climate investment is not deemed politically advantageous. Politicization of climate change has hampered data collection. It hides and obfuscates cost of impacts, adaptation, or mitigation, meaning any opportunity to establish baseline data is compromised. Also, by hiding the costs of climate change it becomes easier to make them invisible and not worth any effort to mitigate. This cycle is poisonous. A more holistic approach to tracking increased overall costs and not just proportional cause will make this obfuscation more difficult, but an acceptance of underlying cause will still be necessary for meaningful investment in prevention. A new embrace of a federal state partnership and state autonomy over mitigation plans will hopefully aid in this development.

WHAT ARE THE NEXT STEPS?

The conclusions expressed in this brief can be condensed to four main points:

- States are facing complex and unique challenges. Though prevention through emissions reduction is universally needed, resiliency strategies will have to be unique to state impacts.
- State impacts are currently under-reported or unknown for a variety of factors, including: a lack of detail in expenditure accounting, unaccounted-for reactionary federal spending in total in-state climate spending, non-universal capital expenditure reports, continued debate of the proportionality of climate causality, and political obfuscation that allows for climate impacts to be absorbed into other areas.
- Increased investigation is needed to determine what climate costs are being absorbed through individuals and business. Nuance across states will require this evaluation to come from individual state perspectives, not a national overview.
- Coalition building is essential to managing shared resources. Various coalitions already in place and currently forming in response to COVID-19 can be vehicles for these conversations.

Steps can be taken to accumulate data needed to understand ongoing and expected future impacts. The first step is to create buckets of cost categories for states that can record costs related to climate change impacts, resiliency, and mitigation. For example, the categories that NOAA's Climatic Data Center looked at are Tropical cyclones, Droughts/heatwaves, Severe local storms, Non-tropical floods, Winter storms, Wildfires, and Freezes.

Some states have begun integrating this strategy into their assessments. California has consistently used similar categories, and Colorado's FACE is a premier example of this type of analysis.[16] Through this pilot program, the state of Colorado has calculated the potential cost of flood, wildfire, and drought through 2050 across moderate and severe climate change scenarios, various rates of population growth, eight sectors of the state-wide economy, and total intra-state regional impacts. Their results are presented with a user-friendly interface and are accessible to the general public along with their underlying data and methods, providing for the possibility of replication and expansion nationwide.

Going forward, to improve and expand upon analyses like FACE, these buckets need to be filled with data, qualitative and quantitative, over several years to baseline existing costs and to understand with greater precision what costs need to be tracked. Take, as an example, infrastructure tracking. One analysis states: "First, all states can report a schedule of condition assessments and maintenance costs to highlight the condition of infrastructure subject to climate risk, something some states already do using the modified approach for infrastructure reporting. This would give legislators, the media and the public an opportunity to better gauge the efforts of the government and hold them accountable. If states had credible estimates for the decline in the

16. Colorado Department of Natural Resources. "Future Avoided Cost Explorer."

value of these assets over time, then they would be able to quantify the amount of funding that is needed to maintain assets…."[17]

Transparent data collection and reporting will improve the quality of data and trust in governments' actions. Currently there is no standard way to track costs of climate change, and though the construction of such a standard is outside of the scope of this paper, an association such as National Association of State Budget Officers should review different approaches. As states experiment with newly emboldened autonomy, this common language will be able to develop. With transparency comes public engagement, and as documented through other state programs like state pensions, "transparency around liabilities has increased the pressure on state legislators to address shortfalls and clarified the financial trade-offs involved."[18] There is no reason that this same logic would not apply in this case.

If states take these steps, over time and in the aggregate, states and regions can predict a range of likely-to-occur events and their associated costs. This can allow for planning and efficient use of resources. The core call to action here is to grapple with the current costs and impacts of climate change on the ground, not just theoretically down the line. Climate change is here—who is paying for it?

Figure 2. Next Steps: A Logical Framework for States Assessing Their Unique Climate Impacts

17. Gilmore, E.A., and T. St. Clair. 2018.
18. Gilmore, E.A., and T. St. Clair. 2018.